



#9

SEQUENCE LISTING

<110> David Baltimore et al.

<120> NUCLEAR FACTORS ASSOCIATED WITH TRANSCRIPTIONAL REGULATION

<130> APBI-P04-035

<140> 10/037415

<141> 2002-01-04

<150> 08/464364

<151> 1995-06-05

<160> 59

<170> PatentIn version 3.1

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 <223> Synthetic binding site

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24

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 <223> Mutant showing slight competition for binding of lysogen protein

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aacagtcaaa catat	75
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aattaccag gtggtgtttt gc	22
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ggcagc atg gtt cac tcc agc atg ggg gct cca gaa ata aga atg tct 108
Met Val His Ser Ser Met Gly Ala Pro Glu Ile Arg Met Ser
1 5 10
aag ccc ctg gag gcc gag aag caa ggt ctg gac tcc cca tca gag cac 156
Lys Pro Leu Glu Ala Glu Lys Gln Gly Leu Asp Ser Pro Ser Glu His
15 20 25 30
aca gac acc gaa aga aat gga cca gac act aat cat cag aac ccc caa 204
Thr Asp Thr Glu Arg Asn Gly Pro Asp Thr Asn His Gln Asn Pro Gln
35 40 45
aat aag acc tcc cca ttc tcc gtg tcc cca act ggc ccc agt aca aag 252
Asn Lys Thr Ser Pro Phe Ser Val Ser Pro Thr Gly Pro Ser Thr Lys
50 55 60
atc aag gct gaa gac ccc agt ggc gat tca gcc cca gca gca ccc ctg 300
Ile Lys Ala Glu Asp Pro Ser Gly Asp Ser Ala Pro Ala Ala Pro Leu

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65	70	75	
ccc cct cag ccg gcc cag cct cat ctg ccc cag gcc caa ctc atg ttg			348
Pro Pro Gln Pro Ala Gln Pro His Leu Pro Gln Ala Gln Leu Met Leu			
80	85	90	
acg ggc agc cag cta gct ggg gac ata cag cag ctc ctc cag ctc cag			396
Thr Gly Ser Gln Leu Ala Gly Asp Ile Gln Gln Leu Leu Gln Leu Gln			
95	100	105	110
cag ctg gtg ctt gtg cca ggc cac cac ctc cag cca cct gct cag ttc			444
Gln Leu Val Leu Val Pro Gly His His Leu Gln Pro Pro Ala Gln Phe			
115	120	125	
ctg cta ccg cag gcc cag cag agc cag cca ggc ctg cta ccg aca cca			492
Leu Leu Pro Gln Ala Gln Gln Ser Gln Pro Gly Leu Leu Pro Thr Pro			
130	135	140	
aat cta ttc cag cta cct cag caa acc cag gga gct ctt ctg acc tcc			540
Asn Leu Phe Gln Leu Pro Gln Thr Gln Gly Ala Leu Leu Thr Ser			
145	150	155	
cag ccc cgg gcc ggg ctt ccc aca cag gcc gtg acc cgc cct acg ctg			588
Gln Pro Arg Ala Gly Leu Pro Thr Gln Ala Val Thr Arg Pro Thr Leu			
160	165	170	
ccc gac ccg cac ctc tcg cac ccg cag ccc ccc aaa tgc ttg gag cca			636
Pro Asp Pro His Leu Ser His Pro Gln Pro Pro Lys Cys Leu Glu Pro			
175	180	185	190
cca tcc cac ccc gag gag ccc agt gat ctg gag gag ctg gag caa ttc			684
Pro Ser His Pro Glu Glu Pro Ser Asp Leu Glu Glu Leu Glu Gln Phe			
195	200	205	
gcc cgc acc ttc aag caa cgc cgc atc aag ctg ggc ttc acg cag ggt			732
Ala Arg Thr Phe Lys Gln Arg Arg Ile Lys Leu Gly Phe Thr Gln Gly			
210	215	220	
gat gtg ggc ctg gcc atg ggc aag ctc tac ggc aac gac ttc agc cag			780
Asp Val Gly Leu Ala Met Gly Lys Leu Tyr Gly Asn Asp Phe Ser Gln			
225	230	235	
acg acc att tcc cgc ttc gag gcc ctc aac ctg agc ttc aag aac atg			828
Thr Thr Ile Ser Arg Phe Glu Ala Leu Asn Leu Ser Phe Lys Asn Met			
240	245	250	
tgc aaa ctc aag ccc ctc ctg gag aag tgg ctc aac gat gca gag act			876
Cys Lys Leu Lys Pro Leu Leu Glu Lys Trp Leu Asn Asp Ala Glu Thr			
255	260	265	270
atg tct gtg gac tca agc ctg ccc agc ccc aac cag ctg agc agc ccc			924
Met Ser Val Asp Ser Ser Leu Pro Ser Pro Asn Gln Leu Ser Ser Pro			
275	280	285	
agc ctg ggt ttc gac ggc ctg ccc ggc cgg aga cgc aag aag agg acc			972
Ser Leu Gly Phe Asp Gly Leu Pro Gly Arg Arg Arg Lys Lys Arg Thr			
290	295	300	
agc atc gag aca aac gtc cgc ttc gcc tta gag aag agt ttt cta gcg			1020
Ser Ile Glu Thr Asn Val Arg Phe Ala Leu Glu Lys Ser Phe Leu Ala			
305	310	315	
aac cag aag cct acc tca gag gag atc ctg ctg atc gcc gag cag ctg			1068
Asn Gln Lys Pro Thr Ser Glu Glu Ile Leu Leu Ile Ala Glu Gln Leu			
320	325	330	
cac atg gag aag gaa gtg atc cgc gtc tgg ttc tgc aac cgg cgc cag			1116
His Met Glu Lys Glu Val Ile Arg Val Trp Phe Cys Asn Arg Arg Gln			
335	340	345	350
aag gag aaa cgc atc aac ccc tgc agt gcg gcc ccc atg ctg ccc agc			1164
Lys Glu Lys Arg Ile Asn Pro Cys Ser Ala Ala Pro Met Leu Pro Ser			
355	360	365	
cca ggg aag ccg gcc agc tac agc ccc cat atg gtc aca ccc caa ggg			1212
Pro Gly Lys Pro Ala Ser Tyr Ser Pro His Met Val Thr Pro Gln Gly			
370	375	380	
ggc gcg ggg acc tta ccg ttg tcc caa gct tcc agc agt ctg agc aca			1260
Gly Ala Gly Thr Leu Pro Leu Ser Gln Ala Ser Ser Ser Leu Ser Thr			


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      385              390              395
aca gtt act acc tta tcc tca gct gtg ggg acg ctc cac ccc agc cgg      1308
Thr Val Thr Thr Leu Ser Ser Ala Val Gly Thr Leu His Pro Ser Arg
      400              405              410
aca gct gga ggg ggt ggg ggc ggg ggc ggg gct gcg ccc ccc ctc aat      1356
Thr Ala Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala Ala Pro Pro Leu Asn
      415              420              425              430
tcc atc ccc tct gtc act ccc cca ccc ccg gcc acc acc aac agc aca      1404
Ser Ile Pro Ser Val Thr Pro Pro Pro Pro Ala Thr Thr Asn Ser Thr
      435              440              445
aac ccc agc cct caa ggc agc cac tcg gct atc ggc ttg tca ggc ctg      1452
Asn Pro Ser Pro Gln Gly Ser His Ser Ala Ile Gly Leu Ser Gly Leu
      450              455              460
aac ccc agc acg gggtaagtgg gtgcacgtgg gaagctgtgg ggagaagcag      1504
Asn Pro Ser Thr
      465
ggtcgctgct gcttctaggg tggggagcgg caccacagtt atgttggcag gtccctgccc      1564
ctgctaagtc ctctgctttg cctcttgcag aagcacaatg gtgggggttga gctccggctg      1624
agtccagccc tcatgagcaa caaccctttg gccactatcc aaggtgcgtg ctgcctcatg      1684
tcacacccat cgtcaccagc cccggaattc gag      1717

<210> 39
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<212> PRT
<213> Homo sapiens

<400> 39
Met Val His Ser Ser Met Gly Ala Pro Glu Ile Arg Met Ser Lys Pro
1              5              10              15
Leu Glu Ala Glu Lys Gln Gly Leu Asp Ser Pro Ser Glu His Thr Asp
      20              25              30
Thr Glu Arg Asn Gly Pro Asp Thr Asn His Gln Asn Pro Gln Asn Lys
      35              40              45
Thr Ser Pro Phe Ser Val Ser Pro Thr Gly Pro Ser Thr Lys Ile Lys
      50              55              60
Ala Glu Asp Pro Ser Gly Asp Ser Ala Pro Ala Ala Pro Leu Pro Pro
      65              70              75              80
Gln Pro Ala Gln Pro His Leu Pro Gln Ala Gln Leu Met Leu Thr Gly
      85              90              95
Ser Gln Leu Ala Gly Asp Ile Gln Gln Leu Leu Gln Leu Gln Gln Leu
      100              105              110
Val Leu Val Pro Gly His His Leu Gln Pro Pro Ala Gln Phe Leu Leu
      115              120              125
Pro Gln Ala Gln Gln Ser Gln Pro Gly Leu Leu Pro Thr Pro Asn Leu
      130              135              140
Phe Gln Leu Pro Gln Gln Thr Gln Gly Ala Leu Leu Thr Ser Gln Pro
      145              150              155              160
Arg Ala Gly Leu Pro Thr Gln Ala Val Thr Arg Pro Thr Leu Pro Asp
      165              170              175

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Pro His Leu Ser His Pro Gln Pro Pro Lys Cys Leu Glu Pro Pro Ser
180                               185                               190

His Pro Glu Glu Pro Ser Asp Leu Glu Glu Leu Glu Gln Phe Ala Arg
195                               200                               205

Thr Phe Lys Gln Arg Arg Ile Lys Leu Gly Phe Thr Gln Gly Asp Val
210                               215                               220

Gly Leu Ala Met Gly Lys Leu Tyr Gly Asn Asp Phe Ser Gln Thr Thr
225                               230                               235                               240

Ile Ser Arg Phe Glu Ala Leu Asn Leu Ser Phe Lys Asn Met Cys Lys
245                               250                               255

Leu Lys Pro Leu Leu Glu Lys Trp Leu Asn Asp Ala Glu Thr Met Ser
260                               265                               270

Val Asp Ser Ser Leu Pro Ser Pro Asn Gln Leu Ser Ser Pro Ser Leu
275                               280                               285

Gly Phe Asp Gly Leu Pro Gly Arg Arg Arg Lys Lys Arg Thr Ser Ile
290                               295                               300

Glu Thr Asn Val Arg Phe Ala Leu Glu Lys Ser Phe Leu Ala Asn Gln
305                               310                               315                               320

Lys Pro Thr Ser Glu Glu Ile Leu Leu Ile Ala Glu Gln Leu His Met
325                               330                               335

Glu Lys Glu Val Ile Arg Val Trp Phe Cys Asn Arg Arg Gln Lys Glu
340                               345                               350

Lys Arg Ile Asn Pro Cys Ser Ala Ala Pro Met Leu Pro Ser Pro Gly
355                               360                               365

Lys Pro Ala Ser Tyr Ser Pro His Met Val Thr Pro Gln Gly Gly Ala
370                               375                               380

Gly Thr Leu Pro Leu Ser Gln Ala Ser Ser Ser Leu Ser Thr Thr Val
385                               390                               395                               400

Thr Thr Leu Ser Ser Ala Val Gly Thr Leu His Pro Ser Arg Thr Ala
405                               410                               415

Gly Gly Gly Gly Gly Gly Gly Gly Ala Ala Pro Pro Leu Asn Ser Ile
420                               425                               430

Pro Ser Val Thr Pro Pro Pro Pro Ala Thr Thr Asn Ser Thr Asn Pro
435                               440                               445

Ser Pro Gln Gly Ser His Ser Ala Ile Gly Leu Ser Gly Leu Asn Pro
450                               455                               460

Ser Thr
465

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<213> Homo sapiens

<400> 40

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Cys Gly Pro Gly His Gly Gln Ala Leu Arg Gln Arg Leu Gln Pro Asp
1          5          10          15
Asp His Phe Pro Leu Arg Gly Pro Gln Pro Glu Leu Gln Glu His Val
20          25          30
Gln Thr Gln Ala Pro Pro Gly Glu Val Ala Gln Arg Cys Arg Asp Tyr
35          40          45
Val Cys Gly Leu Lys Pro Ala Gln Pro Gln Pro Ala Glu Gln Pro Gln
50          55          60
Pro Gly Phe Arg Ala Cys Met Pro Glu Thr Gln Glu Glu Asp Gln Met
65          70          75          80
Arg Asp Lys Lys Pro Leu Arg Leu Arg Glu Glu Phe Ser Ser Glu Pro
85          90          95
Glu Ala Tyr Leu Arg Gly Asp Pro Ala Asp Arg Arg Ala Ala Ala His
100         105         110
Gly Glu Gly Ser Asp Pro Arg Leu Val Leu Gln Pro Ala Pro Glu Gly
115         120         125
Glu Thr His Gln Pro Leu Gln Cys Gly Pro His Ala Ala Gln Pro Arg
130         135         140
Glu Ala Gly Gln Leu Gln Pro Pro Tyr Gly His Thr Pro Ala Gly Arg
145         150         155         160
Gly Asp Leu Thr Val Val Pro Ser Phe Gln Gln Ser Glu His Asn Ser
165         170         175
Tyr Tyr Leu Ile Leu Ser Cys Gly Asp Ala Pro Pro Gln Pro Asp Ser
180         185         190
Asn Met Gly Trp Gly Met Gly Arg Gly Cys Ala Pro Pro Gln Phe His
195         200         205
Pro Leu Cys His Ser Pro Thr Pro Gly His Asn Gln Gln His Lys Pro
210         215         220
Gln Pro Ser Arg Gln Pro Leu Gly Tyr Met Leu Val Ala Pro Glu Pro
225         230         235         240
Gln Asn Gly Val Ser Gly Cys Thr Trp Glu Ala Val Gly Arg Ser Arg
245         250         255
Val Ala Ala Ala Ser Arg Val Gly Ser Gly Thr Pro Val Met Leu Ala
260         265         270
Gly Pro Cys Pro Cys
275

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<222> (1)..(90)

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<400> 41

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1           5           10           15
acg ggc cct ggc ctc tgg tgg aac cct gcc cct tac cag cct      90
Thr Gly Pro Gly Leu Trp Trp Asn Pro Ala Pro Tyr Gln Pro
           20           25           30
tgatggcagc gggaatctgg tgctgggggc agccggtgca gccccgggga gccctggcct 150
ggtgacctcg ccgctcttct tgaatcatgc tgggctgccc ctgctcagca ccccgacctg 210
tgtgggcctg gtctcagcag cggctgcggg tgtggcagcc tccatctcca gcaagtctcc 270
tggcctctcc tcctcatcct cttcatcctc atcctcctcc tcctccactt gcagcgagac 330
ggcagcacag accctggagg tccagggggg cccgaggcag ggtccaaacc tgagtgaggg 390
ccagccatgc ctccctccc attcctctgg tccctgcccc ggaattc      437

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<210> 42

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<212> PRT

<213> Homo sapiens

<400> 42

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Pro Gln Gly Ser His Ser Ala Ile Gly Leu Ser Gly Leu Asn Pro Ser
1           5           10           15
Thr Gly Pro Gly Leu Trp Trp Asn Pro Ala Pro Tyr Gln Pro
           20           25           30

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<210> 43

<211> 50

<212> PRT

<213> Homo sapiens

<400> 43

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Ser Ala Gln Pro Leu Gly Tyr Arg Leu Val Met Pro Glu Pro Gln Met
1           5           10           15
Gly Pro Asn Pro Leu Val Glu Pro Cys Pro Leu Pro Ala Leu Met Ala
           20           25           30
Ala Gly Ile Trp Cys Trp Gly Gln Pro Val Gln Pro Arg Gly Ala Leu
           35           40           45

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Ala Trp
50

<210> 44

<211> 62

<212> PRT

<213> Homo sapiens

<400> 44

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Arg Arg Lys Lys Arg Thr Ser Ile Glu Thr Asn Val Arg Phe Ala Leu
1           5           10           15

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Glu Lys Ser Phe Leu Ala Asn Gln Lys Pro Thr Ser Glu Glu Ile Leu
20 25 30

Leu Ile Ala Glu Gln Leu His Met Glu Lys Glu Val Ile Arg Val Trp
35 40 45

Phe Cys Asn Arg Arg Gln Lys Glu Lys Arg Ile Asn Pro Cys
50 55 60

<210> 45

<211> 57

<212> PRT

<213> Homo sapiens

<400> 45

Ser Pro Lys Gly Lys Ser Ser Ile Ser Pro Gln Ala Arg Ala Phe Leu
1 5 10 15

Glu Gln Val Phe Arg Arg Lys Gln Ser Leu Asn Ser Lys Glu Lys Glu
20 25 30

Glu Val Ala Lys Lys Cys Gly Ile Thr Pro Leu Gln Val Arg Val Trp
35 40 45

Phe Ile Asn Lys Arg Met Arg Ser Lys
50 55

<210> 46

<211> 59

<212> PRT

<213> Homo sapiens

<400> 46

Lys Pro Tyr Arg Gly His Arg Phe Thr Lys Glu Asn Val Arg Ile Leu
1 5 10 15

Glu Ser Trp Phe Ala Lys Asn Pro Tyr Leu Asp Thr Lys Gly Leu Glu
20 25 30

Asn Leu Met Asn Thr Ser Leu Ser Arg Ile Gln Ile Lys Asn Trp Val
35 40 45

Ser Asn Arg Arg Arg Lys Glu Lys Thr Ile Thr
50 55

<210> 47

<211> 60

<212> PRT

<213> Homo sapiens

<400> 47

Gln Arg Pro Lys Arg Thr Arg Ala Lys Gly Glu Ala Leu Asp Val Leu
1 5 10 15

Lys Arg Lys Phe Glu Ile Asn Pro Thr Pro Ser Leu Val Glu Arg Lys
20 25 30

Lys Ile Ser Asp Leu Ile Gly Met Pro Glu Lys Asn Val Arg Ile Trp
35 40 45

Phe Gln Asn Arg Arg Ser Lys Glu Arg Arg Leu Lys
50 55 60

<210> 48
<211> 60
<212> PRT
<213> Homo sapiens

<400> 48
Arg Arg Gly Pro Arg Thr Thr Ile Lys Gln Asn Gln Leu Asp Val Leu
1 5 10 15

Asn Glu Met Phe Ser Asn Thr Pro Lys Pro Ser Lys His Ala Arg Ala
20 25 30

Lys Leu Ala Leu Glu Thr Gly Leu Ser Met Arg Val Ile Gln Val Trp
35 40 45

Phe Gln Asn Arg Arg Ser Lys Glu Arg Arg Leu Lys
50 55 60

<210> 49
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<212> PRT
<213> Homo sapiens

<400> 49
Ser Lys Lys Gln Arg Val Leu Phe Ser Glu Glu Gln Lys Glu Ala Leu
1 5 10 15

Arg Leu Ala Phe Ala Leu Asp Pro Tyr Pro Asn Val Gly Thr Ile Glu
20 25 30

Phe Leu Ala Asn Glu Leu Gly Leu Ala Thr Arg Thr Ile Thr Asn Trp
35 40 45

Phe His Asn His Arg Met Arg Leu Lys Gln Gln Val
50 55 60

<210> 50
<211> 60
<212> PRT
<213> Homo sapiens

<400> 50
Glu Lys Arg Pro Arg Thr Ala Phe Ser Ser Glu Gln Leu Ala Arg Leu
1 5 10 15

Lys Arg Glu Phe Asn Glu Asn Arg Tyr Leu Thr Glu Arg Arg Arg Gln
20 25 30

Gln Leu Ser Ser Glu Leu Gly Leu Asn Glu Ala Gln Ile Lys Ile Trp
35 40 45

Phe Gln Asn Lys Arg Ala Lys Ile Lys Lys Ser Thr
50 55 60

<210> 51
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<212> PRT
 <213> Homo sapiens

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 Glu Lys Glu Phe His Phe Asn Arg Tyr Leu Thr Arg Arg Arg Arg Ile
 20 25 30
 Glu Ile Ala His Ala Leu Cys Leu Thr Glu Arg Gln Ile Lys Ile Trp
 35 40 45
 Phe Gln Asn Arg Arg Met Lys Trp Lys Lys Glu Asn
 50 55 60

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<210> 53
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<400> 54
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 cgccccggaa ttgggtaccg agctcgaatt c 91

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 Met Thr Pro Pro Pro Pro Pro Lys
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 Val Arg Phe Leu Pro Ser Ile Lys Gly Gly Glu Gly Gly Gly Pro Trp
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 Phe Ile Ser Leu His Cys Val Thr Glu Val Leu Leu Leu Phe Val Asn
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 Ile Leu Asn Tyr Pro Ser Phe Ser Ser Leu His Arg Ala Val Val Arg
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 Pro Leu Glu Gly Ile Pro Arg Leu Gly Thr Pro Pro Pro Ala Pro Ala
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 Glu Arg Gln Gly Gly Leu Leu Pro Pro Asp Asp Arg His Asp Ser Gly
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Val Leu Thr Gln His Cys Gln Pro His His Leu Leu Ala Val Leu Gln	
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Ala Thr Asn Tyr Asn Gly His Thr Cys Leu His Leu Ala Ser Ile Gln	
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Val Leu Leu Leu Phe Val Asn Ile Leu Asn Tyr Pro Ser Phe Ser Ser
35          40          45

Leu His Arg Ala Val Val Arg Pro Leu Glu Gly Ile Pro Arg Leu Gly
50          55          60

Thr Pro Pro Pro Ala Pro Ala Ala Ala Pro Arg Arg Pro Ala Ser Ser
65          70          75          80

Ala Ala Met Leu Ser Ala His Arg Pro Ala Glu Pro Pro Ala Val Glu
85          90          95

Gly Cys Glu Pro Pro Arg Lys Glu Arg Gln Gly Gly Leu Leu Pro Pro
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Asp Asp Arg His Asp Ser Gly Leu Asp Ser Met Lys Glu Glu Glu Tyr
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Arg Gln Leu Val Arg Glu Leu Glu Asp Ile Arg Leu Gln Pro Arg Glu
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Pro Pro Ala Arg Pro His Ala Trp Ala Gln Gln Leu Thr Glu Asp Gly
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Asp Thr Phe Leu His Leu Ala Ile Ile His Glu Glu Lys Ala Leu Ser
165         170         175

Leu Glu Val Ile Arg Gln Ala Ala Gly Asp Ala Ala Phe Leu Asn Phe
180         185         190

Gln Asn Asn Leu Ser Gln Thr Pro Leu His Leu Ala Val Ile Thr Asp
195         200         205

Gln Ala Glu Ile Ala Glu His Leu Leu Lys Ala Gly Cys Asp Leu Asp
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Val Arg Asp Phe Arg Gly Asn Thr Pro Leu His Ile Ala Cys Gln Gln
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Gly Ser Leu Arg Ser Val Ser Val Leu Thr Gln His Cys Gln Pro His
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His Leu Leu Ala Val Leu Gln Ala Thr Asn Tyr Asn Gly His Thr Cys
260         265         270

Leu His Leu Ala Ser Ile Gln Gly Tyr Leu Ala Val Val Glu Tyr Leu
275         280         285

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Leu Ser Leu Gly Ala Asp Val Asn Ala Gln Glu Pro Cys Asn Gly Arg
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Thr Ala Leu His Leu Ala Val Asp Leu Gln Asn Ser Asp Leu Val Ser
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Leu Leu Val Lys His Gly Pro Asp Val Asn Lys Val Thr Tyr Gln Gly
 325 330 335

Tyr Ser Pro Tyr Gln Leu Thr Trp Ala Glu Thr Thr Pro Ala Tyr Arg
 340 345 350

Ser Ser